

**METHODS AND SYSTEMS FOR  
PRETREATMENT AND PROCESSING OF BIOMASS**

**ABSTRACT**

According to one embodiment of the invention, a system for processing biomass includes a water-impermeable bottom liner, a gravel layer supported by the bottom liner, a drain pipe disposed within the gravel layer, a biomass input device operable to deliver biomass over the gravel layer to form a biomass pile, a lime input device operable to deliver lime to the biomass for pretreating the biomass, a distribution pipe elevated above the gravel layer, and a pump operable to circulate water through the biomass pile by delivering water to the distribution pipe and receiving water from the drain pipe after it has traveled through the biomass pile.

According to another embodiment, a method for biomass pretreatment with alkali, conducted at ambient pressure for approximately 4-16 weeks at temperatures ranging from approximately 25°C to 95°C. Biomass may be lignocellulosic biomass and may be rendered suitable for enzymatic digestion or pulp production.